Determinism and Its Discontents

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Morality, Religion, and the Need for Freedom of Will

Suresh Kanekar

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Determinism and Its Discontents:
Morality, Religion, and the Need for Freedom of Will

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Preface

I have been mulling over the topic of determinism versus freedom of will, off and on, for decades now, beginning 1964 when I prepared my first formal paper, entitled "Psychology and Freedom of Will," for a conference at the University of Poona, soon after I had gotten my M.A. in psychology. The paper appeared in a loosely bound series of cyclostyled papers in two volumes, representing the proceedings of the conference. I suspect that, mercifully, both volumes are now lost to history and none of the papers are likely to surface again to embarrass their authors—at least some of them including myself.

I touched on the topic again, in a 1992 monograph examining and critiquing B. F. Skinner's (Skinner being perhaps the most influential determinist in the history of psychology) contributions after his death, by which time I thought I had a better grip on the subject and a more fruitful perspective on the resolution of the dispute. This book develops and elaborates the ideas presented in that monograph after considering the major pros and cons of the controversy. I am sure many scholars will disagree with me, but at least we might be starting a discussion in a somewhat different direction than usual, perhaps with better outcomes to the debate.

My specialization is not philosophy, although my first degree was in philosophy. But determinism is a topic of vital concern not only to philosophers but also to psychologists, as well as to other thinking and serious-minded people who cannot help contemplating the implications of being human. Hence this attempt to share some views on the issue that have not been given enough consideration by others who have dealt with the subject previously. I am sure my solution to the controversy is not totally unproblematic, but I believe that it is the least problematic of the solutions available as of now.

My consultants on this project are the usual suspects, my son Nissim and my daughter Amita. Nissim has given his time and effort unstintingly, whenever I needed his help or advice. But he should not be held responsible for the views expressed in this book, nor for the errors and deficiencies, perchance still lurking around. Amita has been supportive in a less blatant and more low-key manner.

Chapter 1

The Problem

Is human behavior totally determined by antecedent conditions or is it partly or occasionally free of causal determination? This question has plagued human thinking for centuries and is known as the problem of determinism versus freedom of will. It is not an easily answered question, but also not an easily ignored one for beings with some capacity for cerebration. Even apart from professional philosophers, ordinary human beings must have pondered this issue in some guise or the other. Many might have wondered about, if not believed in, the total determination of their lives by a superhuman power or an abstract entity called fate or destiny. This thought has been expressed beautifully and forcefully by the great Persian poet-mathematician Omar Khayyám in the following quatrain as translated by Edward FitzGerald:

> The Moving Finger writes; and, having writ,
> Moves on: nor all thy Piety nor Wit
> Shall lure it back to cancel half a Line,
> Nor all thy tears wash out a word of it.

Religious thinking on this issue is rather confused because of the incompatibility between the dogma of God's omnipotence and the doctrine of human accountability, both of which being critical for religion's raison d'être.

The belief in the determination of human destiny can lead to fatalism, which needs to be distinguished from determinism. A fatalist gives up all efforts to ameliorate his or her situation on the grounds that the efforts are meaningless in view of the predetermined future. But a determinist can strive to achieve goals with the understanding that human striving is a link in the causal chain of events. Of course, it can be argued that whether a person is a fatalist (or, for that matter, a determinist) will be determined by the person's past. And we have a paradox, if not an impasse.

If determinism is true, there is a cause-and-effect chain of events that goes back all the way to the beginning of the universe, the idea of such a beginning being itself rather incomprehensible. An inexorable sequence of events has the mind-boggling implication that what is happening now is the inevitable consequence of what happened millions of years ago. For instance, one might entertain the seemingly inescapable proposition that it was determined right at the big bang, if not earlier, that I would be typing on the word processor at this moment. This thought, on the other hand, may seem preposterous to people because it violates their intuitive understanding of the human condition. The counterintuitive nature of determinism has been described by Gilbert Ryle as follows:

> When people consider the problems of the Freedom of the Will and try to imagine their own careers as analogous to those of clocks or water-courses, they tend to boggle at the idea that their own immediate future is already unalterably fixed and predictable. It seems absurd to suppose that what I am just about to think, feel, or do is already preappointed, though people are apt to find no such absurdity in the supposition that the futures of other people are so preappointed. The so-called 'feeling of spontaneity' is closely connected with this inability to imagine that what I am going to think or do can already be anticipated. (Ryle, 1949/1963, p. 187)

Causal determinism appears to obfuscate the distinction between right and wrong, moral and immoral, good and bad, as well as between beautiful and ugly, with these words denuded of any semblance of objective connotation. These words seem to implicate totally subjective feelings, which naturally would mean a lack of unanimity regarding their applications.

Directly antagonistic to the position of determinism is the doctrine of libertarianism, according to which humans have freedom of will which enables them to choose from different courses of action and also renders them accountable for the choices they make. This assumption is apparently the sine qua non of morality as well as criminal justice. If my behavior is entirely determined by past events, including events that took place before my birth, how can I be held responsible for the crimes I commit? Why should I be blamed or punished for the same? Actually, the very concepts of crime and sin seem to lose their meaning within the perspective of determinism, as does the notion of morality.

Chapter 2

Knowledge

Epistemology is one of the most interesting, albeit frustrating, branches of philosophy. It is concerned with if and how we can establish the truth of our knowledge. René Descartes proposed that some of our knowledge was innate and some was learned, but the British school of empiricism swore by experience as the sole source of human knowledge. John Locke, the founder of British empiricism, believed that there are no innate ideas, the human mind being a tabula rasa and all knowledge coming from experience based on sense perception.

Three criteria have been proposed for establishing the truth of a proposition: correspondence, agreement, and pragmatism. According to the criterion of correspondence, a statement is true if the statement corresponds with objective reality. According to the criterion of agreement, a proposition is true if everybody agrees that it is true. According to the principle of pragmatism, a proposition is true if it works.

The principle of correspondence is nicely illustrated by the logician Alfred Tarski's (1944, p. 343) famous contention that

> *The sentence "snow is white" is true if, and only if, snow is white.*

Tarski's tautologous observation that the truth of a sentence consists in its correspondence to reality ignores the serious problem raised by this criterion of truth, which essentially tells us merely that snow is white if snow is white. But how do we know that snow is white, and thus the truth of the corresponding statement? The problem is not solved. The task still remains of finding evidence for the snow's being white.

The agreement criterion is perhaps the shakiest of all, even though it may be the one that is used more frequently than others. First, does everybody have to agree regarding the truth of a proposition? Can we use the majority principle in the absence of unanimity? More important, there seems to be no justification for truth being contingent on people's agreement. It is not inconceivable that all humans agree about the truth of a completely false proposition. Many people in the ancient days, and even in modern times, have believed in untenable propositions. The establishment of truth by a democratic procedure doesn't seem to have any rational basis at all.

The pragmatic criterion is perhaps the most cogent on the surface: It is true if it works. But again it may not be true even if it works, or rather seems to work. One may eat grandma's chicken soup and find one's cold cured. But it may not be the soup that cured the cold. The philosopher William James, a leader of the school of pragmatism, believed that if religion works for a person then religion is valid. So, if praying works for you prayer is efficacious, almost by definition. Thus, truth may differ from person to person or from time to time for the same person, which can create its own problem. Also, we need to establish that the proposition really works, and not merely appears to work as in the case of grandma's soup, or prayer for that matter.

None of the above three criteria is full proof. They are not mutually exclusive though, and may be present all together, buttressing one another. But even if all three criteria are ostensibly satisfied we can never be really certain of the truth of a given factual proposition.

* * *

Our knowledge of the world outside us appears to be on very precarious grounds. As Bertrand Russell (1940, p. 286) puts it,

> epistemological skepticism has a logical foundation, namely the principle that it is never possible to deduce the existence of something from the existence of something else.... You look out of the window, and observe that you can see three houses. You turn back into the room and say "three houses are visible from the window." The kind of sceptic that I have in mind would say "you mean three houses *were* visible." You would reply "but they can't have vanished in this little moment." You might look again and say "yes,

> there they are still." The sceptic would retort: "I grant that when you looked again they were there again, but what makes you think they had been there in the interval?" You would only be able to say "because I see them whenever I look." The sceptic would say "then you ought to infer that they are caused by your looking." You will never succeed in getting any evidence against this view, because you can't find out what the houses look like when no one is looking at them.

The philosophical skeptic questions the leap of faith from premises involving sensory experience to conclusions about the real world. We have direct knowledge only about our sense impressions, and merely inferential knowledge about the world outside of our senses. Valid deduction requires the same entities in the premises and the conclusions of an argument, but our understanding of the world has objects in the conclusions and sensory impressions in the premises, the two obviously not being the same. Inductively, we may be able to generalize from past sensory experiences to future sensory experiences, but strictly speaking we cannot generalize inductively from sensory experiences to the existence of real objects outside of sensory experiences. The inference of objective existence from subjective experience is logically indefensible (Ayer, 1973; Russell, 1948).

Although certainty is feasible in logical or mathematical deduction, here too skepticism is relevant with respect to the premises of such reasoning. In the case of the probably most often cited syllogism, namely, All men are mortal, Socrates is a man, and therefore Socrates is mortal, the conclusion is indisputably true, but only if the premises are true, and the truth of the premises has to be established through observation and inductive reasoning. The conclusions of deductive logic are analytical, or rather tautological; they do not really add to our knowledge. The assertion of Socrates being mortal is not very enlightening, in that it does not advance knowledge, given that all men are mortal and Socrates is a man. Synthetic generalizations add to knowledge, but they are less than absolutely certain as they are based on induction, which can never be infallible.

Induction is succinctly defined by John Stuart Mill as generalization from experience. More elaborately, induction

> consists in inferring from some individual instances in which a phenomenon is observed to occur, that it occurs in all instances of a certain class; namely, in all which *resemble* the former, in what are regarded as the material circumstances. (Mill, 1872/1973, p. 306)

The inherent undependability of induction is illustrated by the fictional story of a turkey, an expert in logic, who is drawing careful inferences from empirical data. The turkey is brought to a farm, and fed in the morning and during the rest of the day. He is wary in the beginning and is not sure of his fate. But as many days go by during which he is fed regularly and looked after solicitously, he uses inductive logic to conclude that he was safe and could expect to be taken care of during the rest of his natural life in the regal manner to which he was accustomed. But he is tragically disillusioned on Thanksgiving Day, giving a lie to inductive generalization. This story, heavily embellished above, has been attributed to Bertrand Russell, who apparently did not write about a turkey but rather a chicken, as follows: "The man who has fed the chicken every day throughout its life at last wrings its neck instead, showing that more refined views as to the uniformity of nature would have been useful to the chicken" (Russell, 1912/1959, p. 63). Another oft-cited example of falsified induction is the earlier belief that all swans were white, which was later demolished by the discovery of black swans in Australia. On the other hand, notwithstanding its fallibility, inductive generalization is an inevitable, practical, and economical process of preparing ourselves for future happenings on the basis of past experiences, with the caveat that it is always tentative and susceptible to correction with the emergence of contrary evidence.

Alfred Ayer (1946) rejects metaphysics as nonsensical because of its conception of reality as transcending the possibilities of experience. He proposes that there are only two kinds of significant propositions, analytic and synthetic. Analytic propositions are a priori propositions which are true only by virtue of being tautological (e.g., a widow is a woman whose husband is dead, either p is true or p is not true), not depending at all on experience for their validity. Statements of logic and mathematics are par excellence analytic propositions which make no contribution to our knowledge of facts. Synthetic propositions, on the other hand, are empirical propositions which add to our knowledge of facts, depending on experience for their validity, but can never be taken as certain, however often they might have been corroborated by evidence. Thus, empirical (synthetic) propositions are always hypotheses which at best are probable, but never certain, whereas tautological (analytic) propositions can claim certainty at the cost of being uninformative. Ayer's argument essentially paraphrases the celebrated pronouncement of David Hume (1748/1990, p. 509), presented below:

> If we take in our hand any volume; of divinity or school metaphysics, for instance; let us ask, *Does it contain any abstract reasoning* [analytic propositions] *concerning quantity or number?* No. *Does it contain any experimental reasoning* [synthetic propositions] *concerning matter of fact and existence?* No. Commit it then to the flames: for it can contain nothing but sophistry and illusion.

* * *

The contrast between perception and reality has been starkly brought out by the parable of the cave dwellers in Plato's *Republic* and poignantly dramatized by the concept of *maya* in Indian philosophy. George Berkeley, with his ultra-empiricist doctrine of *esse est percipi* which says in effect that matter cannot exist except in the perception of a mind, had to invoke the all-perceiving God to potentialize the existence of anything that is not accessible to human perception. When James Boswell and his future biographee Samuel Johnson were discussing Berkeley's "ingenious sophistry to prove the nonexistence of matter," Boswell lamented that even though Berkeley was obviously wrong it was impossible to refute his position, to which Johnson promptly responded by kicking a large stone, with such force as made him rebound from it, and declaring, "I refute it *thus*" (Boswell, 1811/1992a, p. 296). On a different occasion, more wittily and less painfully, Johnson called out to a defender of Berkeley's monistic preference of mind over matter as the latter was leaving the company, "Pray, Sir, don't leave us; for we may perhaps forget to think of you, and then you will cease to exist" (Boswell, 1811/1992b, p. 326).

One might wonder how one knows about the existence of God whom no one has ever perceived. There are problems with cognition too. As the history of mankind has abundantly shown, humans are capable of believing just about anything that is conceivable, irrespective of the evidence. To take an extreme case, in the rare mental disorder known as Cotard's syndrome (Debruyne, Portzky, Van den Eynde, & Audenaert, 2009), the patient often thinks he or she is dead, almost standing René Descartes's famous argument on its head with the implication of *cogito ergo non sum*. The point is that perception and cognition are not totally reliable paths to reality. But perception and cognition are all we humans have to go by, and there we are.

David Hume (1748/1990), a prominent leader of the influential British school of empiricism, believes that the ultimate source of our beliefs is our perceptions or memories thereof, either first hand, or derived (second hand, third hand, or nth hand) from perceptions or memories of other people. In the empiricist vindication of historical knowledge, even though we ourselves have not seen Caesar being assassinated at a meeting of the Roman Senate, we believe that this assassination did happen because of the unanimous testimony of historians, which itself may derive from earlier testimony, which again may follow even earlier testimony, and so on, till we finally come to the firsthand eyewitness account of the event.

Karl Popper (1963/2002a) justifiably suggests the possibility of the historians' unanimity being grounded on the same spurious link in the chain of testimonies. Popper claims that tracing back knowledge to its observational sources can lead us back to the earlier sources of the immediate sources, and then again to even earlier sources, with this infinite regress crippling the validity of empiricism, especially given the necessity of evaluating the dependability of these sources. Making fun of the naïve empiricist and verificationist approach to sources of knowledge, Popper relates the experience of Mark Twain:

> On his [Mark Twain's] first appointment as a reporter, he tells us, the editor of the newspaper instructed him never to report anything unless he could *verify it or confirm it by personal knowledge*. So he described a social event as follows: 'A woman giving the name of Mrs James Jones, who is reported to be one of the society leaders of the city, is said to have given what purported to be a party yesterday to a number of alleged ladies. The hostess claims to be the wife of a reputed attorney.' (Popper, 1963/2002a, p. 557)

The Mark Twain anecdote is a telling indictment of the silly insistence on firsthand experience as the only criterion of truth (naïve empiricism, as Popper calls it), rather than of empiricism per se. We believe in many events as facts, not because of direct personal experience with them, but through various lines of evidence, and inference therefrom, converging toward establishing the veridicality of the events, as in the case of my belief in a man landing on the moon in 1969 as a real happening rather than mere American propaganda. There would be no criminal convictions if the judicial process depended only on eyewitness testimony, because generally murderers and other criminals do not oblige the criminal justice system by arranging to have witnesses to their crimes. Even in the absence of witnesses, various pieces of circumstantial evidence can establish the identity of the criminal beyond reasonable doubt.

We also need to take into consideration the fact that direct personal experience of an event is not a foolproof guarantee that the event occurred, even though such an experience tends to generate a much stronger subjective conviction than does indirect evidence, as indicated by the oft-heard *cri de coeur*, “But I saw it with my own eyes.” Rape victims have been known to have misidentified their assailants because of errors of perception or memory. There is considerable research evidence coming from psychologists like Elizabeth Loftus (1979) of the unreliability of eyewitness accounts because of their vulnerability to distortions in perceptions and memories. Some of these distortions may stem from motivational influences that the witnesses may not even be aware of. We have to concede the fallibility of direct personal experience as the final arbiter of truth, even when we can assume the honesty of the witness. What all this means is that experience has to be subjected to corroboration and critical evaluation, but we do not have to reject experience *in toto*, like Plato with his cave-dweller parable, and thus throw away the baby along with the bathwater.

Popper’s rejection of the empiricist approach to knowledge seems incongruous with his enthusiasm for Tarski’s correspondence theory of truth, according to which truth of a statement is contingent on its correspondence with facts. But such a correspondence can be established only through empirical investigation, rather than by armchair ratiocination, and so falls squarely into the bailiwick of empiricism. Logical reasoning can help in organizing and interpreting empirical data, but cannot be a substitute for the latter as a source of knowledge. Experience lays down the foundation on which intellect raises the edifice of human knowledge.

While acknowledging the inadequacy of empiricism as a theory of knowledge, Russell (1948) suggests that empiricist philosophy embraces the indubitable fact “that all human knowledge is uncertain, inexact, and partial” (p. 527). Analogous to Winston Churchill’s dictum that democracy is the worst form of government except for all other forms of government, Russell appears to believe that empiricism is the worst theory of knowledge with the exception of all other theories of knowledge. Even before his pessimistic conclusion about human knowledge, Russell (1948, p. 526) offers a more upbeat evolutionary perspective on knowledge, as follows:

> As mankind have advanced in intelligence, their inferential habits have come gradually nearer to agreement with the laws of nature which have made these habits, throughout, more often a source of true expectations than of false ones. The forming of inferential habits which lead to true expectations is part of the adaptation to the environment upon which biological survival depends.

* * *

Within the framework of B. F. Skinner's radical behaviorism, knowledge is behavior and valid knowledge is effective behavior. To Skinner (1974), a proposition is true in so far as it enables a person to respond effectively to the situation it represents. This is essentially the pragmatic criterion of truth. But the determination of the effectiveness of behavior is far from unproblematic. Zuriff (1980, p. 345) claims that

> According to the pragmatic theory under consideration, to assess the veracity of a bit of verbal behavior, it is necessary to determine the effectiveness of the behavior it generates. However, for the radical behaviorist, this determination takes the form of further behavior. This further behavior is accepted as true only if it meets the pragmatic criterion of generating effective behavior. However, to ascertain if it meets the criterion, a further determination is required, and, of course, this further determination will consist only of more behavior requiring yet more determinations. The pragmatic criterion cannot logically ever be applied, for to do so requires an infinite series of determinations.

Effectiveness of behavior is concerned with values, such as human survival, and this murky area lies beyond the purview of empirical science. A science of behavior cannot determine human survival, or anything else, as a value. Science can only describe, not prescribe. It is totally incapable of telling us how we should behave, although it can enlighten us in the matter of how we do behave. It can discover the causal relationships between behaviors and outcomes, and thus may be able to tell us how best to go about the business of survival, but it can never establish survival as worth striving for. As Skinner (1953, pp. 432–433) puts it,

> When a man jumps out of the way of an approaching car, we may say that he "chooses life rather than death." But he does not jump because he has so chosen; he jumps because jumping is evoked by certain stimulating circumstances.… He was likely to jump or to learn to jump because his ancestors were selected from a large population just because they jumped or learned to jump quickly from the paths of moving objects. Those who did not jump or could not learn to jump are probably not represented by contemporary descendants.

Skinner thus neatly finesses the intractable problem of infinite regress in the determination of values (Zuriff, 1980) by asserting that human behavior is not governed by the prior choice of any value.

Zuriff (1980, pp. 348–349) suggests that effectiveness as a criterion of truth in radical behaviorist epistemology "is applicable only because humans have evolved to the point at which they already accept certain things as true without that explicit criterion." Evolution has programmed us to believe in some things and to disbelieve in others.

Chapter 3

Causality

Causality is the foundation of determinism, and the two concepts seem to stand or fall together, back to back, in a symbiotic relationship. Causality, per se, is much less likely to be disputed by the layperson than determinism, even though it has stirred its own controversy, especially relatively recently in light of quantum mechanics.

Probably, the earliest important exposition of causality came from Aristotle, who proposed four categories of causes. The *material* cause of a thing was the matter or substance of which the thing is made; for example, the material cause of a table could be wood. The *formal* cause of a thing would be the form, shape, structure, organization, or visualization of the thing; the formal cause of a table could be a flat top held up by legs or other supports. The *efficient* cause of a thing would be how it came into being or what brought it into existence; in the case of a table the efficient cause is likely to be a carpenter's handiwork. The *final* cause of a thing is its goal or the purpose for which it was created; thus the final cause of a table would be its service as an accessory to dinner or writing, or more generally as an implement for bearing things on its surface. It should be noted that cause is a translation of Aristotle's Greek word *aition*, which is probably more akin to explanation than to cause as we understand it (Hocutt, 1974).

Aristotle's scheme is very unwieldy, and its application is somewhat constrained. For instance, in the matter of an event instead of a thing, it is difficult to think of a material or formal causation. Also, formal causation is a somewhat murky concept and very difficult to pin down. In general, one has to really make some effort to identify the four causes for events, or even things, without indulging in verbal acrobatics or conceptual contortions.

Aristotle himself was apparently aware of this problem. Of course, we now do not pay much attention to Aristotle's scheme, and have a much simpler understanding of causation—but perhaps not as simple as one would like. Essentially, the modern usage of the word "cause" represents what Aristotle designated as an "efficient cause."

* * *

In modern philosophy, David Hume has made a seminal contribution to our understanding of causality. He essentially repudiated causation, apart from consistent sequential conjunction, asserting that when we say A is the cause of B, all that we really know is that A is always followed by B, nothing less and nothing more. Causality is inferred from the observation of repeated instances of one event (cause) being followed by another (effect), the critical factors here being the regularity of this sequence and the temporal precedence of the cause over the effect. According to Hume (1748/1990, p. 472),

> When we look about us towards external objects, and consider the operation of causes, we are never able, in a single instance, to discover any power or necessary connexion; any quality, which binds the effect to the cause, and renders the one an infallible consequence of the other. We only find, that the one does actually, in fact, follow the other. The impulse of one billiard-ball is attended with motion in the second. This is the whole that appears to the *outward* senses. The mind feels no sentiment or *inward* impression from this succession of objects: Consequently, there is not, in any single, particular instance of cause and effect, anything which can suggest the idea of power or necessary connexion.

Hume is a positivist, *avant la lettre*, an empiricist opposed to metaphysical speculations. He is skeptical about the trustworthiness of human knowledge, especially about the validity of induction, which in his opinion can never be irrefutably established, because even though in our experience B always follows A, there is no guarantee that in the future it will do so. In this he is in good company, sharing the perspective of those perspicacious philosophers and sagacious scientists who, like Hume, are cautiously optimistic about the scientific method as the best path toward reliable knowledge in spite of their principled pessimism regarding the attainment of absolute certainty.

* * *

John Stuart Mill has written extensively about causation as an integral part of scientific thinking in his book on logic. For Mill (1872/1973, pp. 326–327),

> The Law of Causation, the recognition of which is the main pillar of inductive science, is but the familiar truth, that invariability of succession is found by observation to obtain between every fact in nature and some other fact which has preceded it.

Mill (1872/1973) has proposed several methods for establishing causality, of which the most important are the Method of Agreement and the Method of Difference, the other methods being variations or extensions of the two basic methods. The Method of Agreement requires that whenever there is the cause there will be the effect, and vice versa. The Method of Difference requires that if the cause is absent, the effect will be absent too, and vice versa. One problem with this analysis of causation is that it is pertinent only to causes that are both necessary and sufficient. A sufficient cause is one that will definitely bring about the effect. If X and Y are cause and effect in the sense of X being a sufficient cause for the effect Y, whenever X happens Y will certainly happen, although the same effect can happen even in the absence of this particular cause. A necessary cause is one without which the effect will never happen, but also one with which the effect may not happen in the absence of appropriate ancillary contributors to the outcome. If X (a necessary cause) is absent, Y (the effect) will be absent too, but the presence of X may not be followed by the presence of Y. In other words, the absence of a necessary cause ensures the absence of the effect, but the presence of the necessary cause does not ensure the presence of the effect, whereas the presence of the sufficient cause ensures the presence of the effect, but the absence of the sufficient cause does not ensure the absence of the effect. This obviously muddies the waters for the Methods of Agreement and Difference.

* * *

Bertrand Russell (1912–1913), in an early article, almost vehemently denies the utility of the concept of causality. He concludes the article by saying that

> We found first that the law of causality, as usually stated by philosophers, is false, and is not employed in science. We then considered the nature of scientific laws, and found that, instead of stating that one event A is always followed by another event B, they stated functional relations between certain events at certain times, which we call determinants, and other events at earlier or later times or at the same time. (p. 26)

Russell (1912–1913), pointing out conceptual issues regarding causation, proposed the banishment of causality from philosophical discourse. His claim about the demise of causality in science was apparently premature, and as such has been challenged by Suppes, who has marshalled evidence in support of his contention that "Contrary to the days when Russell wrote this essay, the words 'causality' and 'cause' are commonly and widely used by physicists in their most advanced work" (Suppes, 1970, p. 5). Very recently, Yanofsky (2013, p. 370) has unambiguously declared that "Physics is about understanding causes and effects. Mathematics in physics is used to describe the exact *quantity* of causes and effects."

The concerns raised by Russell are neither momentous nor seriously damaging to the idea of causation. More important, the substitution of functional relationships for causal relationships seems to be a semantic, if not cosmetic, change, rather than a substantive advance with respect to conceptual problems. Functional relationships are grounded on causal relationships, and the "determinants" in the above quotation from Russell are to all intents and purposes, at least as antecedents, "causes." Einstein's famous functional relationship, $E = mc^2$, is essentially a matter of causal relationship, as exemplified by the historic fact of nuclear fission *causing* the conversion of rest energy into kinetic and other forms of energy, which in turn *caused* unprecedented devastation in a Japanese city. Incidentally, Russell in his later years seems to have relented in his hostility toward the concept of causality and writes almost enthusiastically about the place of causation in scientific discourse, as is evidenced by his observation that "The power of science is due to its discovery of causal laws," and his definition of a causal law as a "general principle in virtue of which, given sufficient data about certain regions of space-time, it is possible to infer something about certain other regions of space-time" (Russell, 1948, p. 326).

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In discussing causality one cannot ignore the distinction between causes and reasons, which is a concern for both philosophers and psychologists. Buss (1978) started a lively controversy by criticizing psychologists studying attributions for behavior for their exclusive concern with causal attributions and their insensitivity to the logical distinction between reasons and causes. According to Buss, a cause is something that brings about a change, whereas a reason is something for which a change is brought about, to be understood in terms of intentions, purposes, or goals. When a soccer player heads a ball, he is performing an *action* and he can give a reason for doing what he did. If a bowl of cherries falls on his head, this is an *occurrence* which he *suffers* and for which he seeks a cause. People offer reasons to explain what is done *by* them and seek causes to explain what happens *to* them. Although, in ordinary parlance, people might refer to the protagonists in both situations as actors, Buss suggests that, strictly speaking, only when the event is an action can we speak of an actor (or agent, the preferred term in philosophy), and we should use the term sufferer if something happens to the person. Thus the man who heads the soccer ball is an actor, but when a bowl of cherries falls on the man's head he is a sufferer. The actor-observer differences in causal attributions (with actors making situational attributions and observers making dispositional attributions), Buss believes, are vitiated by the assumption that both actors and observers are making causal attributions and thus giving explanations of the same logical type, whereas actors and observers could be giving explanations of different logical types in case of actions, with actors giving reason (in terms of intentions, goals, justifications, etc.) explanations and observers giving causal (implying lawfulness, predictability, etc.) explanations. Buss strongly condemns the treatment of causes and reasons as synonymous or interchangeable with a picturesque sentence: "In collapsing reasons into causes, one is robbed of the critical cutting edge of that distinction—transforming it into a rudderless craft, bobbing around on a sea of hopeless conceptual confusion" (Buss, 1978, p. 1319).